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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 12/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/782,928

Applicant(s)

UEHARA ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### DETAILED ACTION

#### *Remark*

- This Office Action is in response to applicant's amendment filed on September 27, 2006, which has been entered into file.
- By this amendment, the applicant has amended claims 1-2, 5-7, 10, 14, 15, 18-20 and 23.
- Claims 1-24 remain pending in this application.

#### *Drawings*

1. The drawings were received on January 30, 2006. These drawings are **NOT acceptable**.

The proposed amendment to the drawings fails to correct the drawing objection set forth in the previous Office Action, since "X" and "Y" are being claimed in related to " $\tan(1')$ " and "D" such relationship needed to be explicitly illustrated. The objection to the drawing is repeated as follows.

**The applicant is respectfully noted that none of the figures shown where is this angle of 1 arc minute is referred to. It is therefore not clear how does "X" and "Y" are related to  $\tan(1')$ . The applicant is respectfully noted that the specification only gives positive support for the term  $\tan(1')$ , the angle of 1 arc minute therefore has to be indicated in the figures.**

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the symbols "X", "Y" and " $\tan(1')$ " recited in various claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a

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drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Response to Amendment***

3. The amendment filed on January 30, 2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the equation recited in claims 1 and 14 have been amended to include the value "0.000291". The equation is NOT supported by the specification.

Applicant is required to cancel the new matter in the reply to this Office Action.

**The applicant is respectfully noted no where in the specification does this expression:**

**$\tan(1') = \tan(1/60) = \tan(0.0167) = 0.000291$ . The arguments therefore are not persuasive to overcome the rejections.**

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1-5, 11-13, and 14-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not**

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described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reason for rejection based on the newly added matters is set forth in the paragraph above.

The equation has no physical means and is not supported by the specification.

### *Claim Objections*

**6. Claims 1-24 are objected to because of the following informalities:**

(1). The phrase “a first direction perpendicular to said horizontal direction and the vertical direction perpendicular to said horizontal direction and parallel to the surface of said display panel” recited in claim 1 is confusing and wrong since if this phrase is correct then the first direction has to be in the direction NORMAL to the surface of the display panel and it is impossible to define the definition in the normal direction from the display panel. **It is not clear if this first direction is or is not the vertical direction?**

(2). The phrase “a first direction out of the horizontal direction and the vertical direction perpendicular to said horizontal direction *and parallel* to the surface of said display panel” recited in claims 6, 14, and 19 is confusing and indefinite since it is not clear if this phrase means both the horizontal direction and the vertical direction are parallel to the display panel.

(3). The phrase “the point being most distance from said display panel” recited in claim 6 is confusing and indefinite since it is not clear how does the “*most distant*” be defined.

(4). The phrase “the distance between said display panel and point ... set to 500 nm or more” recited in claims 6 and 19 is indefinite and **wrong** since it is implicitly true that the distance has to have an upper limit in order for the definition of the display 175 dpi to be viewable. The specification and the claims fail to disclose what is the actual range of “500 nm or **more**” referred here.

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(5). The value "0.000291" recited in various claims is confusing and indefinite since the claims fail to give a definition and *physical meanings* for such value and the equation with this value. The meaning needed to be *explicitly* stated in the claims to make the scopes of the claims clear.

(6). **Claims 6 and 19 have been amended** to include the phrase "positioning a midpoint between the right eye and the left eye" is confusing, since it is not clear what is considered to be the midpoint? Is the point right at the center between the separation of the right and left eyes? If this is the point then it does not need to be "positioned" since it is inherent by the positions of the two eyes. If it is not this center point then what is this point?

**Appropriate correction is required.**

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1, 3, 11-14, 16, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ichinose et al (PN. 4,987,487).**

**Ichinose et al** teaches a stereoscopic or three-dimensional image display device that is comprised of a *display panel* (51, Figures 8-9 or 100 Figures 10-11) wherein a plurality of pixels sections including pixels displaying an image for right eyes and pixels displaying an image for left eye arranged in matrix form and periodically arranged in horizontal direction, (51-a1, 51-b1 etc. in Figures 8-9 or LLRR in Figures 10-11). The image display device further comprises a lenticular lens, serves as the optical unit that directs light emitted from the pixels displaying said image. It is implicitly true that a three-

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dimensional or stereoscopic visible region is inherently defined by placing the midpoint between a viewer's right and left eyes in the visible range such that the image light emitted from the pixels for displaying the right image will incident to the right eye of the observer and the image light emitted from the pixels for display the left image will incident to the left eye of the observer. Ichinose et al teaches that the normal distance between the midpoint of the *eyes* to the *lenticular lens* or the optical unit is  $D$  and the distance between the *display panel* and the optical unit is  $f'$  (i.e. the focal length of the lenticular length). The actual distance between the midpoint of the eyes and the display panel therefore equals  $D'' = D + f'$ . It is also implicitly true that there is a **most** distant point with distance  $D'$  between the midpoint of the eyes and the display panel within the three-dimensional visible region for allowing the stereoscopic image to be viewable by the observer.

As demonstrated by Figure 8, the *smallest* separation between two adjacent image pixel sections that can be *resolved* by the eyes so that one image from the first pixel section to be directed to left eye and the other image from the adjacent second pixel section to the right eye is indicated in Figure 8 as  $L$ . And the definition of the pixel section is defined as  $1/L$ . From simple geometry one can calculate the definition of the pixel section as the following:

Assuming the *angular separation* between the image lights from the two adjacent pixel sections is  $a$  and the angular separation of the image light after passing through the optical unit or lenticular lens is  $b$ . Then the following condition can be established:

$L/f' = \tan(a)$  and  $e/D = \tan(b)$ . " $e$ " being the separation distance between two eyes and  $D$  is the observation distance.

The actual distance between the midpoint of the two eyes and the display panel ( $D''$ ) and the actual distance between the **most** distant point in the three dimensional visible range and the display panel ( $D'$ ) are defined as follows:

$$D'' = D + f' \quad \text{and} \quad D' > D''.$$

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One can then get the following conditions:

$L + e = (f * \tan(a)) + (D * \tan(b))$ , for paraxial light,  $b=a$ , and  $\tan(a)$  approximately equals to  $a$  in radians and  $\tan(b)$  approximately equals to  $b$  in radians. And if the optical unit is a *parallax barrier*, with slits instead of the lenticular lens, the angle  $a$  will be equal to angle  $b$ . This means the following:

$(L + e)$  approximately equals  $(f + D) * \tan(a)$ , which then equals to  $D * \tan(a)$ . This means

$L < D * \tan(a)$ , or  $1/L > 1/(D * \tan(a))$ , with the conversion factor between millimeter to inch (i.e. 25.4 millimeter per inch),  $1/L > 25.4/(D * \tan(a))$  (dpi). Similarly  $L < D * \tan(a)$ , (i.e. distance measured from display panel to the most distant point in the visible range).

This means  $1/L > 25.4/(DIS * \tan(a))$  (dpi). By setting the distance in the normal direction of the observer to the display panel to be **DIS, wherein DIS is between D' and D"**. The **definition** of the pixel section ( $1/L$ ) therefore is defined with respect to the angular separation of the image light from the adjacent pixel section. This reference however does not teach explicitly to have the definition to satisfy the cited equation " $X > 25.4/(D * 0.000291)$ ". However the specification also fails to give support for such expression, it can only be examined in the broadest interpretations. It is known in the art that general eyesight is 1.0, which means the minimum angular separation, is 1/60 degree or one minute. This means the **definition** is  $1/L > 25.4/(D * \tan(1'))$  or  $1/L > 25.4/(D * 0.000291)$  (dpi), for  $\tan(1')$  equals 0.000291.

With regard to claims 3, and 16, Ichinose et al teaches that the display device having this display panel could be a liquid crystal display device, (please see column 2, line 5 or column 5, lines 38-40).

With regard to claims 11 and 24, Ichinose et al teaches the image display device is intended for displaying three-dimensional images taken from photographs and being processed by a computer, (please see 3). However it does not specify that it is movie picture. But the application of such display apparatus to display movie pictures would have been obvious to one skilled in the art since it involves only feed in



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movie pictures to the computer for processing, and such modification has the advantage of displaying three dimensional movie pictures.

With regard to claims 12-13, this reference also does not teach explicitly that the display apparatus is applied to different portable devices. However since Ichinose et al does teach that the display device includes liquid crystal display and it is known in the art that liquid crystal display device is widely applied in many portable visual devices, such modifications would have been obvious to one skilled in the art to allow this stereoscopic image display device be applied in different *portable* device for providing portable 3D views. It also has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

9. **Claims 2, 4, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichinose et al as applied to claims and 14 above, and further in view of the patent issued to Isono et al (PN. 5,315,377).**

The method and apparatus for outputting image for stereoscopic vision taught by **Ichinose et al** as described for claims 1, 6, 14 and 19 above has met all the limitations of the claims. With regard to claims 2 and 15, this reference does not teach explicitly about the definition of the pixel section in a second direction of the pixels matrix. With regard to claims 4, and 17, this reference also does not teach explicitly that the optical unit can be parallax barriers with a plurality of slits. **Isono et al** in the same field of endeavor teach a three-dimensional image display wherein a *parallax barrier* having a plurality of slits (Figures 2, 4 and 8A), that is aligned with the matrix arrangement of the pixels (Figures 8B and 9) is used to provide the three-dimensional image display. It is implicitly true for square or rectangular type of pixel section, the same definition analysis disclosed above also applies for the second direction of the matrix to allow the image being resolved by the eyes of the observer to achieve stereoscopic viewing. It

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would then have been obvious to one skilled in the art to apply the teachings of Isono et al to modify the display apparatus of Ichinose et al to use parallax barrier, an electronic one as disclosed by Isono et al, as alternative means to achieve the stereoscopic image display for the benefit of allowing different design and control, (the electronic driven parallax barrier has the advantage of controlling the slit size), that suited for different application to achieve the stereoscopic image viewing.

**10. Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichinose et al as applied to claims 1 and 14 above, and further in view of the patent issued to Chikazawa (PN. 5,852,512).**

The method and apparatus for outputting image for stereoscopic vision taught by Ichinose et al as described for claims 1 and 14 above have met all the limitations of the claims. Ichinose et al teaches the optical unit is a *lenticular* lens having a plurality of cylindrical lenses. However it does not teach explicitly that the cylindrical lenses are arranged periodically in the horizontal direction and extended in the vertical direction. But it is true that the lenticular lenses of Ichinose et al are arranged periodically in the horizontal direction. And it is implicitly true that the lenticular lens is extended in a perpendicular direction with respect to the periodical direction as explicitly demonstrated by the teachings of Chikazawa. Chikazawa in the same field of endeavor teaches a lenticular lens having a plurality of cylindrical lenses that are arranged along the horizontal direction of the pixels and extended in the vertical direction. It would have been obvious to one skilled in the art to make the lenticular lens has this geometric arrangement for the benefit of providing horizontal parallax to allow stereoscopic vision.

**11. Claims 1, 3, 6, 8, 11-14, 16, 19, 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Momochi (PN. 5,528,420) in view the patent issued to Ichinose et al (PN. 4,987,487).**

**Momochi** teaches a *method* and *apparatus* for outputting image for stereoscopic vision wherein the apparatus comprises a display panel having a *plurality of pixels* forming pixel sections wherein the plurality of pixels displaying image for the right eye and image for the left eye respectively, and the pixels has a *matrix* form, (please see Figures 4 and 5) and are arranged periodically in horizontal direction. The apparatus further comprises an *optical unit*, such as a *lenticular lens*, for re-emitting image light from the display panel to *right eye and left eye of an observer*, respectively, (please see Figures 6-8). It is implicitly true that a three-dimensional or stereoscopic visible region is inherently defined by placing the midpoint between a viewer's right and left eyes in the visible range such that the image light emitted from the pixels for displaying the right image will incident to the right eye of the observer and the image light emitted from the pixels for display the left image will incident to the left eye of the observer. And it is implicitly true that there is a definite distance ( $D'$ ), in the *normal direction* with respect to the display panel, between the *most* distant point in the three-dimensional visible range and the display panel and there is a definite distance ( $D''$ ), in the normal direction with respect to the display panel, between the *midpoint* of the two eyes of the observer and the display panel.

As demonstrated by the Figure 7, the distance  $D''$ , measured from the midpoint of the two eyes to the display panel, should equal to  $D$  (observation distance) *plus*  $(n \cdot f)$ . The symbol " $n$ " means refractive index of the lenticular lens and " $f$ " means the focal length of the lens. The *smallest* separation between two adjacent image pixel sections that can be *resolved* by the eyes so that one image from the first pixel section to be directed to left eye and the other image from the adjacent second pixel section to the right eye is indicated in Figure 7 as  $\Delta$ . And the definition of the pixel section is defined as  $1/\Delta$ . From simple geometry one can calculate the definition of the pixel section as the following:

Assuming the *angular separation* between the image lights from the two adjacent pixel sections is  $a$  and the angular separation of the image light after passing through the optical unit or lenticular lens is  $b$ . Then the following condition can be established:

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$\Delta/n*f = \tan(a)$  and  $W/D = \tan(b)$ .  $W$  being the separation distance between two eyes and  $D$  is the observation distance.

The actual distance between the midpoint of the two eyes and the display panel ( $D''$ ) and the actual distance between the most distant point in the three dimensional visible range and the display panel ( $D'$ ) are defined as follows:

$$D'' = D + n*f \text{ and } D' > D''.$$

One can then get the following conditions:

$\Delta + W = (n*f) \tan(a) + D \tan(b)$ , for paraxial light,  $b = n*a$ , and  $\tan(a)$  approximately equals to  $a$  in radians and  $\tan(b)$  approximately equals to  $b$  in radians. And if the optical unit is a *parallax barrier* with slits instead of the lenticular lens, the angle  $a$  will be equal to angle  $b$ . This means the following:

$\Delta + W$  approximately equals  $(n*f + D) * \tan(a)$ , which then equals to  $D'' * \tan(a)$ . This means

$\Delta < D'' * \tan(a)$ , or  $1/\Delta > 1/(D'' * \tan(a))$ , with the conversion factor between millimeter to inch (i.e. 25.4 millimeter per inch),  $1/\Delta > 25.4/(D'' * \tan(a))$  (dpi). Similarly  $\Delta < D' * \tan(a)$ , (i.e. distance measured from display panel to the most distant point in the visible range).

This means  $1/\Delta > 25.4/(DIS * \tan(a))$  (dpi). By setting the distance in the normal direction of the observer to the display panel to be **DIS**, wherein **DIS** is between **D'** and **D''**. The **definition** of the pixel section ( $1/\Delta$ ) therefore is defined with respect to the angular separation of the image light from the adjacent pixel section. This reference however does not teach explicitly that the equation for definition is of the form recited in the claims. But the specification also fails to give support and means for the claimed equation such feature can only be examined in the broadest interpretation. It is known in the art that a general eyesight is 1.0, which means the minimum angular separation, is 1/60 degree or one minute. This means the **definition** is  $1/\Delta > 25.4/(D'' * \tan(1'))$  (dpi) or  $1/\Delta > 25.4/(D'' * 0.000291)$  (dpi) for  $\tan(1')$  equals 0.000291.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the pixels of the display device emits the image light. It is known in the art that the geometric relationship between the definition in term of the viewing distance of the observer does not change by whether the fact that the image pixels actually emit the light themselves or the image light reflected from them since the definition is defined by the geometric relationship set forth in above, (the applicant is noted no where in the mathematical deduction above does the fact of the origin of the image light come in to become a determining factor). Furthermore, it is well known in the art to use display device such as liquid crystal display device to provide the display panel having plurality of pixels sections and optical unit that emits the image light emitted from the liquid crystal display device to provide the stereoscopic image display as demonstrated by **Ichinose et al.** **Ichinose et al** teaches explicitly about same geometric relationship between the image definition and the observation viewing distance, (please see Figures 8-9). It would then have been obvious to one skilled in the art to apply the teachings of Ichinose et al to use liquid crystal display device as the display panel for the benefit of allowing the stereoscopic image display arrangement of Momochi be applied to a variety of display device utilizing liquid crystal display device such as television, video game device or computer. **Claims 3, 8, 16 and 21,** are rejected for the same reasons.

With regard to claims 6, and 19, Momochi teaches that for  $\Delta$  assumes values of 0.05 mm, the definition is therefore about 500 dpi, (please see column 10). For observation distance greater than 250 mm from the display panel, the definition of the pixel section is 350 dpi. Although this reference does not teach explicitly that the observation distance is 500 mm, however this observation distance is standard distance in most of the display apparatus, such modification would have been obvious to allow comfortable viewing or observation distance for the observer.

With regard to claims 11 and 24, Momochi teaches the image display device is intended for displaying three-dimensional images taken from photographs and being processed by a computer, (please

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see 3). However it does not specify that it is movie picture. But the application of such display apparatus to display movie pictures would have been obvious to one skilled in the art since it involves only feed in movie pictures to the computer for processing, and such modification has the advantage of displaying three dimensional movie pictures.

With regard to claims 12-13, this reference also does not teach explicitly that the display apparatus is applied to different portable devices. However it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Madham*, 2 USPQ2d 1647 (1987).

12. **Claims 2, 4, 7, 9, 15, 17, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momochi and Ichinose et al as applied to claims 1, 6, 14 and 19 above, and further in view of the patent issued to Isono et al (PN. 5,315,377).**

The method and apparatus for outputting image for stereoscopic vision taught by **Momochi** in view of the teachings of **Ichinose et al** as described for claims 1, 6, 14 and 19 above have met all the limitations of the claims. With regard to claims 2, 7, 15 and 20, this reference does not teach explicitly about the definition of the pixel section in a second direction of the pixels matrix. With regard to claims 4, 9, 17 and 22, this reference also does not teach explicitly that the optical unit can be a parallax barriers with a plurality of slits. **Isono et al** in the same field of endeavor teach a three-dimensional image display wherein a *parallax barrier* having a plurality of slits (Figures 2, 4 and 8A), that is aligned with the matrix arrangement of the pixels (Figures 8B and 9) is used to provide the three-dimensional image display. It is implicitly true for square or rectangular type of pixel section, the same definition analysis disclosed above also applies for the second direction of the matrix to allow the image being resolved by the eyes of the observer to achieve stereoscopic viewing. It would then have been obvious to one skilled in the art to

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apply the teachings of Isono et al to modify the display apparatus of Momochi to use parallax barrier, an electronic one as disclosed by Isono et al, as alternative means to achieve the stereoscopic image display for the benefit of allowing different design and control, (the electronic driven parallax barrier has the advantage of controlling the slit size), that suited for different application to achieve the stereoscopic image viewing.

**13. Claims 5, 10, 18 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momochi and Ichinose et al as applied to claims 1, 6, 14 and 19 above, and further in view of the patent issued to Chikazawa (PN. 5,852,512).**

The method and apparatus for outputting image for stereoscopic vision taught by **Momochi in view of the teachings of Ichinose et al** as described for claims 1, 6, 14 and 19 above have met all the limitations of the claims. Momochi teaches the optical unit is a *lenticular* lens having a plurality of cylindrical lenses. However it does not teach explicitly that the cylindrical lenses are arranged periodically in the horizontal direction and extended in the vertical direction. But it is true that the lenticular lens of Momochi are arranged periodically in the horizontal direction. And it is implicitly true that the lenticular lens is extended in a perpendicular direction with respect to the periodical direction as explicitly demonstrated by the teachings of **Chikazawa**. **Chikazawa** in the same field of endeavor teaches a lenticular lens having a plurality of cylindrical lenses that are arranged along the horizontal direction of the pixels and extended in the vertical direction. It would have been obvious to one skilled in the art to make the lenticular lens has this geometric arrangement for the benefit of providing horizontal parallax to allow stereoscopic vision.

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*Response to Arguments*

14. Applicant's arguments filed on September 22, 2006 have been fully considered but they are not persuasive. The amendments to the claims have been fully considered and they are rejected for the reasons stated above.

15. In response to applicant's arguments concerning the rejections based on the cited references Ichinose et al and Momochi in combination with the well known knowledge of the minimal resolution power for a normal eyesight of a human is 1 arc minute are lacking motivation, the examiner respectfully disagrees for the reasons stated below. The standard 20/20 eyesight or normal vision for a human being is the visual acuity needed to discriminate two points separated by 1 arc minute, (please see the definition of the visual acuity for normal vision page 5 paragraph 6). This is the standard knowledge in the art and it is therefore obvious to one skilled in the art to apply such known visual acuity for normal vision to the disclosures of Ichinose et al and Momochi to determine the definition for the display.

*Conclusion*

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "Visual acuity" from Wikipedia, the online free encyclopedia ([http://en.wikipedia.org/wiki/Visual\\_acuity](http://en.wikipedia.org/wiki/Visual_acuity)).

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action



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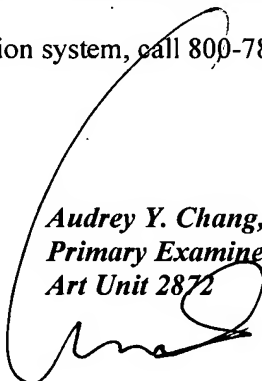
is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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*Art Unit 2872*



A. Chang, Ph.D.